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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/724,131	11/28/2000	Anthony F. Samnells	88-99	6134
23713	7990	01/29/2004	EXAMINER	
GREENLEE WINNER AND SULLIVAN P C				
5370 MANHATTAN CIRCLE				
SUITE 201				
BOULDER, CO 80303				
			FORTUNA, ANA M	
			ART UNIT	PAPER NUMBER
			1723	

DATE MAILED 01/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)	
09/724,131	SAMMELLS, ANTHONY F.	
Examiner	Art Unit	
Ana M Fortuna	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
 Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) 18-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 9, 13 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1448) Paper No(s) 1/17/02 6) ☐ Other _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 4, 9, 13, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vangrunerbeek et al (6,514,394 B1)(hereinafter '394). Reference '394 discloses a sensor or membrane containing a metallic compound immobilized on the porous support (column 1, first paragraph), the penetration of molten metal when the porous support has large pores is also disclosed in '394 (column 2, lines 38-56). The process of making the sensor including the molten salt is also disclosed, and including the steps of melting the of the electrode material follow by immobilization of halide into the porous support and sealing the material or sensor support by immersing the support under the melt surface (column 3, lines 19-51, column 5, lines 34-). The sensor or membrane or porous material as made of metal made of a metal, e.g. zirconia based (column 2, lines 45-48). "394 fails to disclose the membrane as gas impermeable. The product including the matrix and the impregnated molten salt, as claimed in claim 1 is not disclosed as membrane, but as sensor, however, a porous support have a percentage of porosity, including the electron and ion conducting properties provided by the support, halide content (molten salt, e.g. $MgCl_2$, and molten material, are disclosed in '393 (column 6, lines 8-25, column 5, lines 19-62). It would have been obvious to

one skilled in the art at the time the invention was made to provide electrolyte materials within a porous support, and further seal the support to make it gas tight, e.g. by immersing the porous material in the electrolyte, e.g. molten salt, and further protecting the electrolyte, as disclosed in '394 (column 8, lines 6-68, column 9, lines 1-8).

The transition metal matrix as claimed in claims 3-4 (or porous material) is disclosed by '394 (column 4, lines 46-48), e.g. molybdenum. As to claim 17, the reactor or electrochemical cell formed with the sensor or membrane is disclosed, using more than one sensor will depend on process requirements, it would have been obvious to one skilled in the art at the time the invention was made to use more than one sensor or membrane devices in a reactor depending on the level of material detection required. As to claim 9, the matrix as made of ceramic is disclosed in '394, e.g. MgO (column 2, lines 57-59).

3. Claims 2, 5-8, 11-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The membrane with the pores distribution as claimed in claim 2, 11, and dependent claims is not disclosed or suggested in the prior art of record. The matrix composition or materials claimed in claims 5-8, has also not been found in combination with the membrane having the claimed properties of claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana M Fortuna whose telephone number is (571) 272-1141. The examiner can normally be reached on 9:30-6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on (571) 272-1151. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Ana M Fortuna
Primary Examiner
Art Unit 1723

AMF

January 25, 2004